The Nuts and Bolts of Water Conservation

In the Beginning…the Water Audit

Water Audit Steps

- **Getting to know the building that you audit**

Building Use Determinations

A. Function
  - Office
  - Manufacturing
  - Lab
  - Etc.

Building Use (Continued)

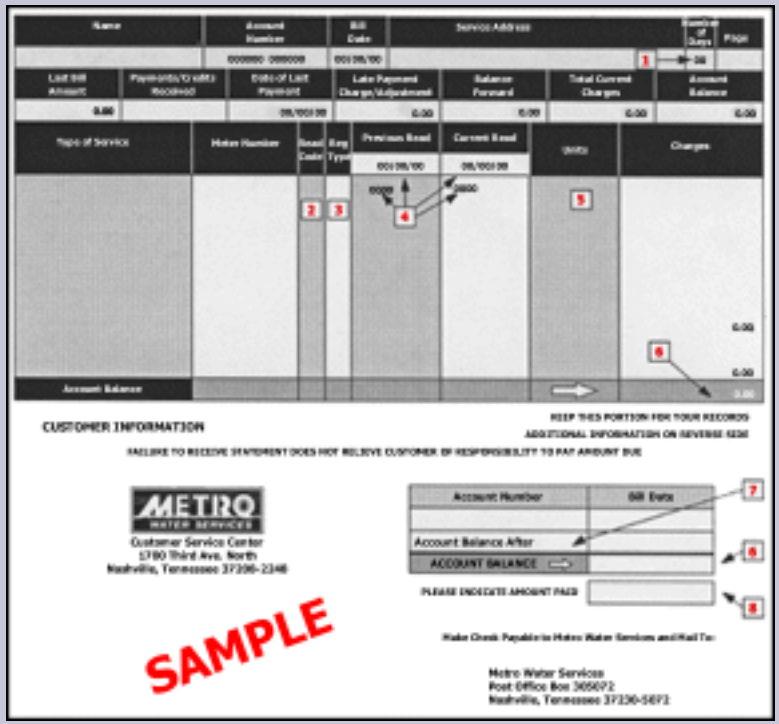
B. Number of daily occupants
  - Hours used

C. Who is in charge of building maintenance
  - Supervisor
  - Maintenance workers

Building Use (Continued)

D. Historical water use

– Try to obtain a complete 3-year history of water use.



Maintenance Personnel

- Maintenance Management
  - Important to get management buy in

Maintenance Personnel

- Maintenance Workers
  - Can be biggest help or worst hindrance

Maintenance Personnel

- Maintenance Workers
  - Most important people to have helping
  - Can save hours of work
  - May have great ideas on how to save water.

Maintenance Personnel

- Maintenance Workers
  - Could have uncaring attitude
  - Could lack proper training
  - Can result in effort and water down the drain.

Water System Evaluation

- Locate the building's water meter and main shut-off valve.
- Determine a time when a building is not occupied.

Water Pressure

- Greater water pressure = More water use for building
- Excess water pressure = More plumbing maintenance

Water Pressure

- Pressure > 80psi is against the plumbing code
- Pressure >80psi will void the fixture manufactures' warranty
- High water pressure is dangerous

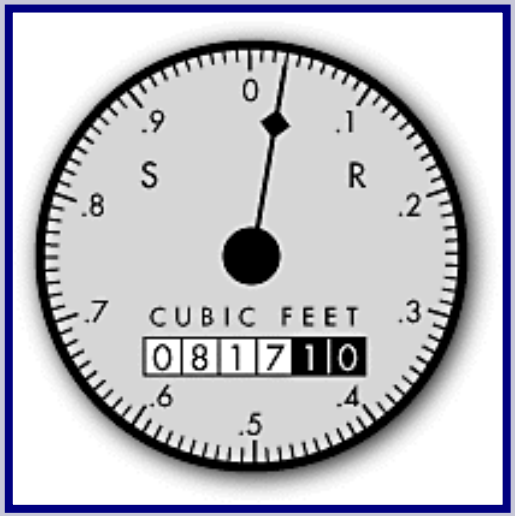
Size of the Building's Water Meter

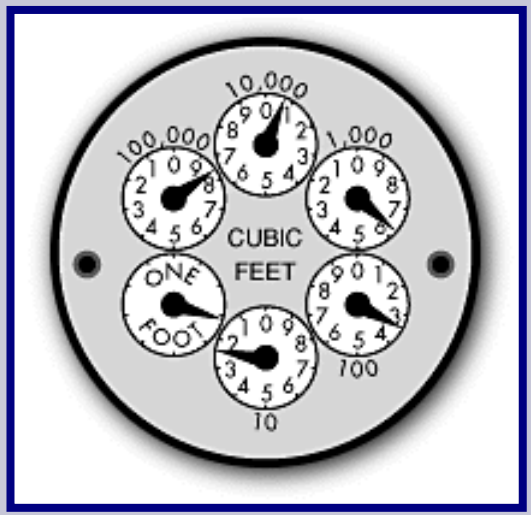
Meter Size and Water Conservation

- PROs
  - Less water use can allow for a meter downsizing
  - Meter downsizing can result in substantial instant savings

Meter Size and Water Conservation

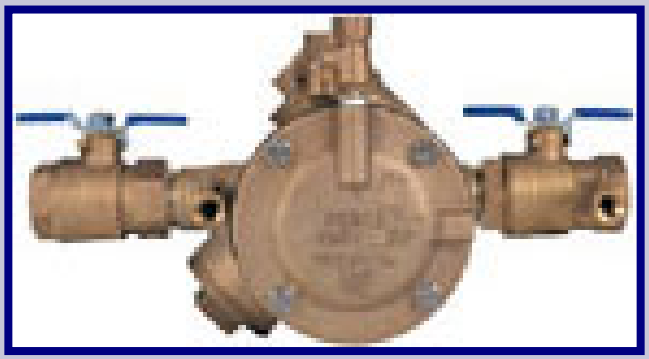
- CONs
  - Requires Specific Expertise Including:
    - **Careful, sometimes complex calculations**
    - **Analysis of future growth needs**
    - **Understanding of landscaping and landscape irrigation systems**





RP Devices

- Explanation
  - A type of backflow prevention assembly
  - Installed to protect the drinking water supply from accidental contamination
  - Stands for Reduced Pressure Assembly

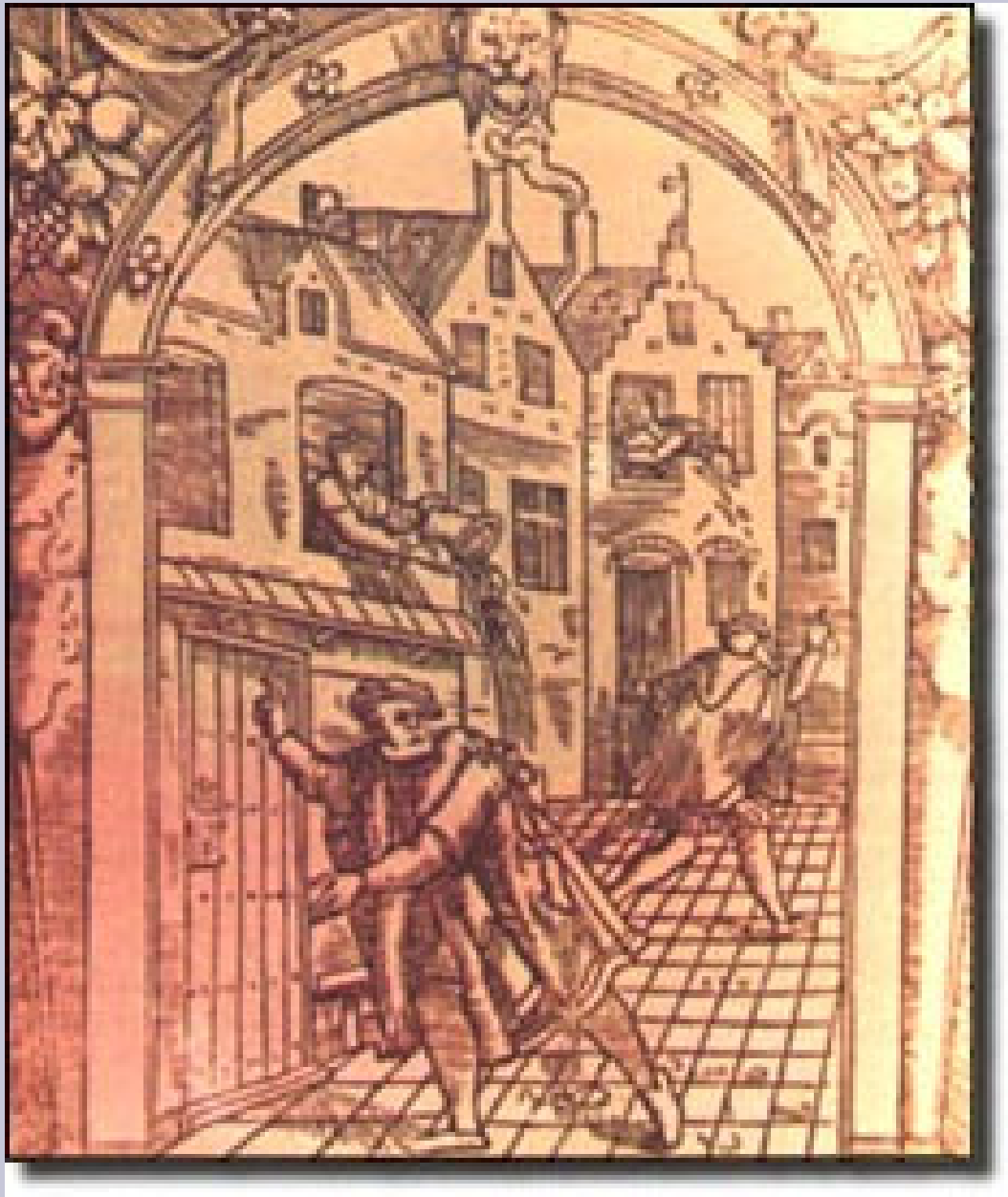


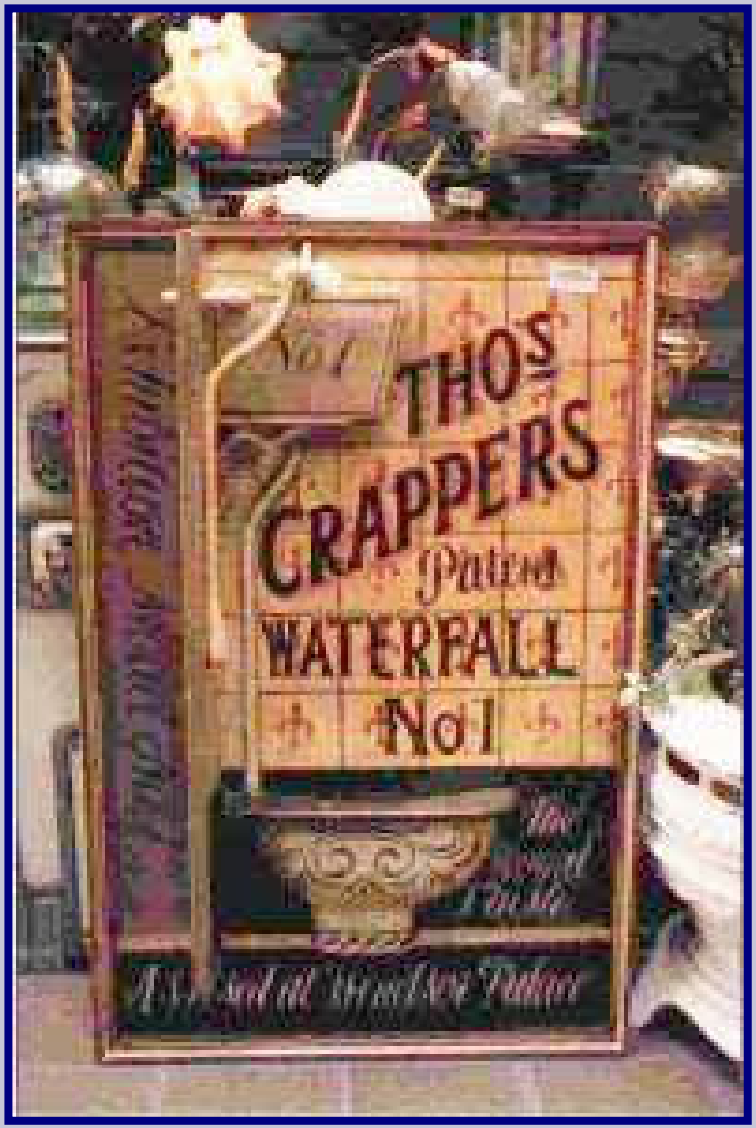
RP Devices

- Issues
  - Operates by purging potentially contaminated water out of the system through a relief valve
  - When placed near the water meter, creates a closed system for the building
  - Can leak and cause substantial water waste

Toilets

- Toilets
  - History of the toilet.

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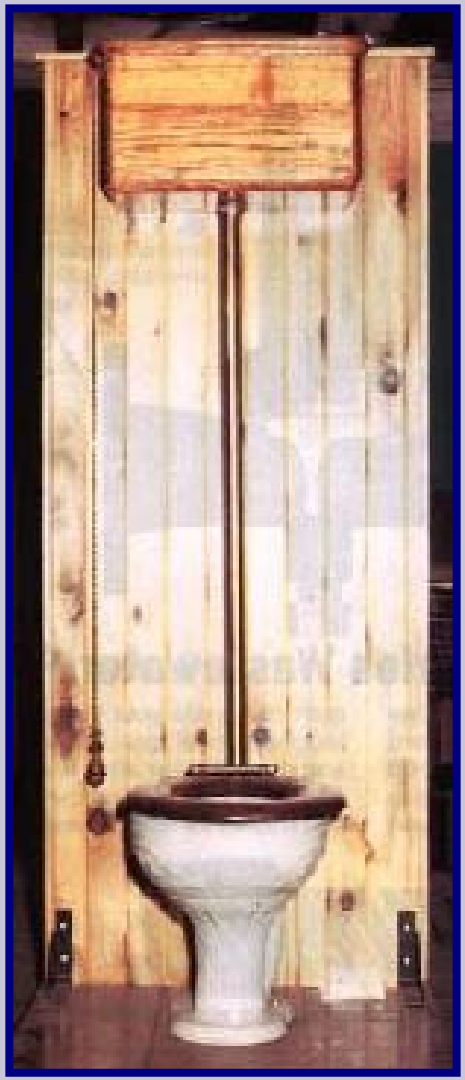


Toilets

- Flows
  - Pre 1980 toilets
    - **used: 5-7 gallons per flush (gpf)**
  - 1980-91
    - **3.5-5gpf**
  - 1991
    - **1.6gpf**
      - *www.Theplumber.com*

Toilet Types

- <u>The Standard Tank and Bowl Toilet.</u>
  a. The most common toilet used.
  b. The major drawbacks.
  c. Advantages
  d. Types of flush values
  e. The flapper
  f. The fill tube

Toilet Types

2. The Pressurized Toilet
   a. Cost
   b. The pressurized tank
   c. Advantages

Toilet Types

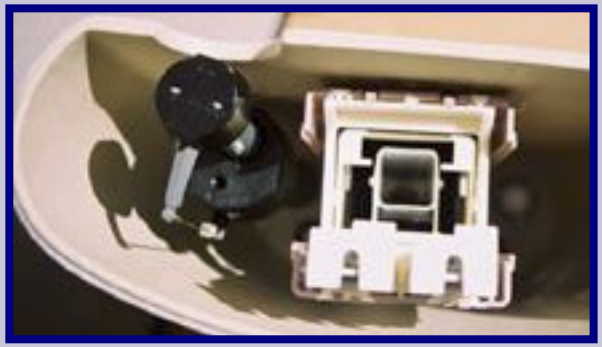
3. Flush Valve Toilet

- One of the most used toilets in commercial application
- Number of different styles
- Major advantages
- Disadvantages
- Types of flush valves.
- Flush valve conversion

  5, 3.5, 1.6, 1.5, 1.0, .05 gallons per flush

Toilet Types

4. Dual Flush Toilets
   - Two flush modes
     - **#1**
     - **#2**
   - Required in some countries (Australia)



caroma
AUSTRALIA

Toilet Types

- 5. Composting Toilets
  - Low to No Water Use
  - Environmentally Beneficial

Frequently Asked Questions

1. *Why do I want to install 1.6gpf toilet, if I have to flush the toilet twice? Won't any savings be lost?*
   - **5.0 x 4 = 20 gallons**
   - **3.5 x 4 = 14 gallons.**
   - **1.6 x 5 = 8 gallons**
   - **14 – 8 = 6 gallons saved even if you do flush it twice once a day.**

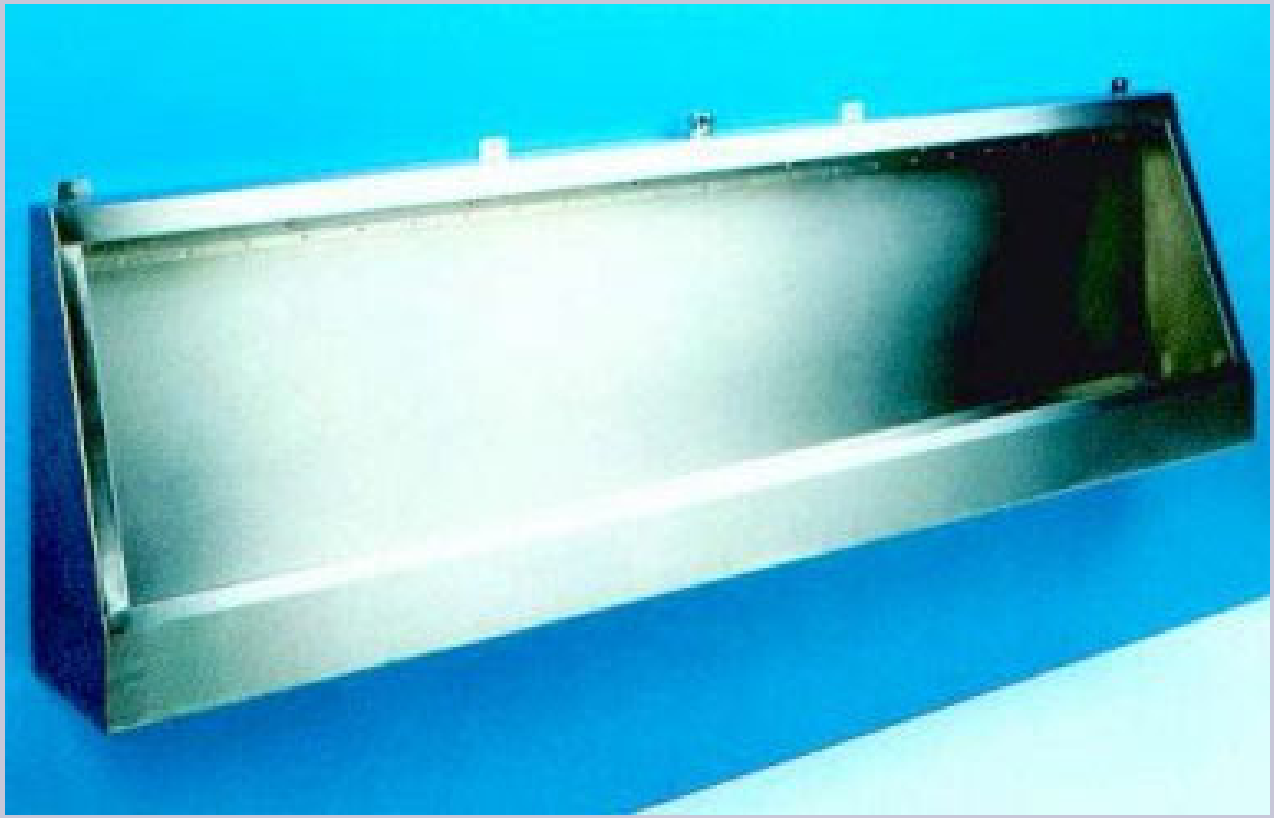
Frequently Asked Questions

- *What are the advantages of 1.6gpf toilets?*
  - **They will not over flow when they stop-up.**
  - **Less noise because of shorter**
  - **fill cycles.**
  - **Less of a load on drain fields.**

Urinal

<u>Old Styles</u>

- Trough Urinals
  - About 5 gals/flush
  - Some ran continuously at 8-9 gals/minute
- Floor Mount
  - 2.5-3 gals/flush



Urinal

Newer Styles

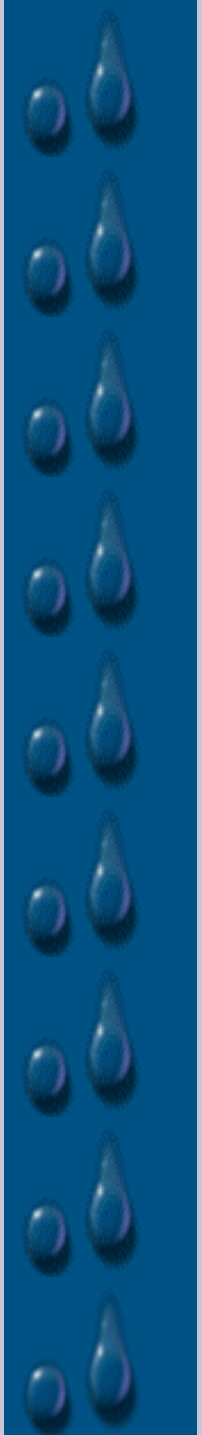
- No water Urinal
- ¾ gal
- 1 gal

Faucets

There are a number of different faucets in the plumbing field. The most used faucet is the lavatory faucet. Aerators are what determines the flow rate of most faucets.

Faucet Types

- Lavatory faucets
  - Can be restricted to 0.5 gal without complaints
  - Can have sensors and timed mechanical openers
- Kitchen faucets
  - Need 2.5 gpm



Faucet Types

Mop Sink Faucets

Laundry Sink Faucets

Bar sink Faucets

Hose Bibbs

Other Water Using Devices & Appliances

Shower	**Dishwashers**
Garbage Disposal	**Clothes Washers**
Water Fountains	**RO Units**
Water Softeners	**Trap Primers**
Evaporative Cooling	**Cooling Towers**
Ice Makers	**Water-cooled Equipment**
Film Developers	**Boilers**
Sterilization Equipment	**Irrigation**

Maximum Allowable Water Use For Plumbing Fixtures

Water Closets (all styles)	**1.6 gal/flush**
Urinals	**1.0 gal/flush**
Commercial lavatory faucets (Metering type)	**0.25 gal/cycle**
Commercial lavatory faucets	**0.50 gal/minute**
Showerheads (Non-metering type)	**2.5 gal/minute**

Maintenance

- Poor maintenance:
  - Is a major cause of water waste.
- Good maintenance:
  - Involves creation of regular maintenance schedules
  - Saves on water and energy throughout the building.

Conclusion

- Every point that uses water should be noted and the following questions should be asked:
- Can less water accomplish the same task?
- Can something other than water accomplish the same task?

Conclusion

- People in the building will in the end have the biggest effect on the conservation efforts. Internal program support is the most essential part of water conservation.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